IN THE TITLE

Please amend the title of the subject application, as previously amended by the Preliminary Amendment, a second time, as follows:

AN OPTICAL SYSTEM FOR FORMING AN ILLUMINATED PATTERN ON A MATERIAL IN MOTION AND WHICH ILLUMINATED PATTERN IS SYNCHRONIZED WITH A DETECTION DEVICE

IN THE SUBSTITUTE SPECIFICATION

Please cancel paragraphs 003, 054, 064, and 066 of the Substitute Specification. Please replace those cancelled paragraphs with replacement paragraphs 003, 054, 064, and 066, all as follows:

[003] Optical systems for forming an illuminated structure are used primarily in connection with the recording of images of machine-processed material in the field of industrial image processing, such as, for example ,in the recording of imprinted material which is processed in connection with stocks and bonds. The optical system is used in or on a printing press, preferably in or on a rotary printing press, and in particular in or on a printing press operated in, for example, an offset printing method, a steel engraving method, a screen printing method or a hot-process embossing method. Alternatively, or in addition to such an arrangement in or on a printing press, an optical system can also be arranged in or on a machine which further processes a printed product. Image recording is performed for the purpose of providing an at least partial, and preferably a complete image representation of the moving imprinted material. This image representation can be done with or without taking a measurement of previously determined characteristics of the imprinted material, in order to evaluate this material regarding the quality of a process step previously performed in the machine. Optical systems of this general type are typically employed, for example, in an inline inspection system and therefore are typically a component of such an inline inspection system.

[0054] The scattering body 38 of the illumination arrangement 06, in a manner ~~name~~ which is the same as the arrangement of the mirrors 11, 16 and/or of the lens 18, simultaneously acts in a shaping and homogenizing manner, with respect to the distribution of the light that is emitted by the light sources 07. The scattering body 38 contributes, in particular, to a shadow-free, diffused illumination of the illuminated strip 01, even on a surface 02 of the material 03 which may be provided with a delicate structure. Additionally , in spite of the distance A07 each of the light sources 07 has from the surface 02 of the material 03, the illuminated strip 01 is simultaneously formed as a very bright illuminated band because of the illumination arrangement 06 . The arrangement of the mirrors 11, 16 and/or of the lens 18, as well as the provision of the scattering bodies 38 in particular, contributes to the light exiting the illumination arrangement 06 with a homogeneous light distribution. The result is that an inner structure of the illumination arrangement 06, such as, for example, the arrangement of its individual light sources 07, is not even represented on a reflecting surface 02 of the material 03, such as, for example, on a reflecting lacquer, a cold seal, a window thread, a patch, or the like. As a result, this arrangement of individual light sources 07 does not become visible even when viewed under the respective reflection angle.

[0064] As previously described, several groups of light sources 07 are preferably provided in the illumination arrangement 06. Each of the several groups of light sources 07 preferably has at least one electrical current source 22, and in particular has

a constant electrical current source 22 assigned to it. The lengths of switched-on times t3 of the light sources 07 are controlled by the control device 23, which is connected with the illumination arrangement 06, for example in groups. These lengths t3 can also ~~canalso~~ be controlled singly independently of each other by the respective electrical current sources 22. A profile of the amount of light can be set over the length of the light sources 07 of the illumination arrangement 06, which are preferably arranged in lines. Setting a profile of the amount of light, preferably along the length L01 of the illuminated strip 01, has the advantage that transmission losses can be compensated for by the use of an optical device, which is not specifically represented, of the detection device 08, for example the line- scanning camera 08.

[0066] Fig. 16 shows the chronological behavior of the detection device 08, such as, for example, the line-scanning camera 08, and also shows the chronological behavior of the light sources 07 of the illumination arrangement 06. The line-scanning camera 08 is switched on at a defined point in time in accordance with the upper, first time progression of Fig. 16. The length of exposure time t1 of the line-scanning camera 08 starts at this point in time. Following the end of the exposure time t1, an off time t2, which is a function of the speed of the moving material 03, immediately follows between two adjoining image lines of the line-scanning camera 08 which follow each other in the movement direction 04 of the material 03. In accordance with the center, second time progression depicted in Fig. 16, at least one light source 07, which is triggered as a

function of the control of the line-scanning camera 08, is turned on by the electrical current source 22, which is controlled by the control device 23 simultaneously with the length of exposure time t1 of the line-scanning camera 08. Following a delay time t4 for switching on the light source 07, or in other words, after a physically required time until the start of light emission, this light source 07 then remains switched on for a length of switched-on time t3. The length of switched-on time t3, and preferably also a sum of the times consisting of a delay time t4 and of the length of switched-on time t3, is of shorter length than is the length of exposure time t1 of the line-scanning camera 08. The chronological behavior of the line-scanning camera 08 and of the light sources 07 is periodically repeated in accordance with the above-described correlation. The chronological behavior of the switched-on time t5 for a constant light source is represented in the lower, third time progression in Fig. 16 only as a comparison with the chronological behavior of the triggered switched-on time t3 of the light source 05.